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A FOLLOW-UP REPORT ON AVAILABLE DATA
FOR CALIFORNIA AND STELLER SEA LION
(ZALOPHUS CALIFORNIANUS, EUMETOPHANS JUBATA)
EXPLOITATION PRIOR TO 1950

By

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A Follow-up Report on Available Data for California and
Steller Sea Lion (Zalophus californianus, Eumetopians
jubata) Exploitation Prior to 1950

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December 1984

This report was prepared by Harry E. Helling under Contract No. NOAA/84-JGA-271 for the National Marine Fisheries Service, Southwest Fisheries Center, La Jolla, California. The statements, findings, conclusions and recommendations herein are those of the author and do not necessarily reflect the views of the National Marine Fisheries Service. Dr. Douglas P. DeMaster of the Southwest Fisheries Center served as Chief Official Technical Representative for this contract.

Administrative Report No. LJ-84-45C

CONTENTS

	Page
INTRODUCTION.....	1
HISTORY.....	1
NATURE AND EXTENT OF AVAILABLE DATA.....	3
TABLE.....	4
RESULTS.....	6
LITERATURE CITED.....	9

INTRODUCTION

The California sea lion, Zalophus californianus, and the Steller sea lion, Eumetopias jubata, present a particular problem whenever any concrete historic population information is needed. Extensive exploitation is known to have occurred, yet the available historic data needed for any calculations are sporadic and subjective.

A question that has been posed by the National Marine Fisheries Service and the California Department of Fish and Game is whether an Optimal Sustainable Population (OSP) level could be determined from existing historical data. The optimum population level of a marine mammal stock is defined to occur between the maximum net productivity level (MNPL) and the maximum carrying capacity (K). Traditionally, the MNPL is estimated using a fixed percentage of carrying capacity that existed before a stock was exploited by man. The historic data currently available for sea lions appear to be inadequate for such calculation.

A recently published paper, *Exploitation of Sea Lions Prior to 1950* (Cass, in press), outlines available data relevant to historic exploitation of sea lions. The object of this study is to follow up on that report. Emphasis, however, will be directed towards personal communication as a means of supplementing existing literature for determining the nature and extent of available historic data.

HISTORY

Any interpretation of historic data must take into account early authors' tendencies to confuse the two species. Bonnot (1928) states "it seems the ranges of the two species have never been definitely placed." Although there is a possibility of range shift since Scammon's early descriptions, the Steller sea lions are generally described to occur north of Point Conception and the California sea lions to the south.

Prior to 1860, sea lion populations were described as plentiful (Scammon, 1874). Subsequent to that time, a broad range of pressures was exerted on the population, causing extreme fluctuations from pre-exploited levels. Beginning in 1860, sea lions were hunted extensively for oil and hides. By the late 1870's, sea lions were reduced to such low levels that it was no longer profitable to hunt them (Bonnot, 1928), and the petroleum industries had matured and practical methods of securing petroleum made such utilization (of sea lions) obsolete (Bonnot, 1938).

In 1899, the growing fishing industry charged that sea lions were destroying the fisheries off the coast of California. After several State hearings, the California Fish and Game Commission ordered 10,000 of the presumed 30,000 population killed (Merriam, 1902). Although the order was eventually rescinded, it was not until several thousand sea lions had been killed at Ano Nuevo Island (Bonnot, 1928).

From 1900 to 1929, few organized collections of sea lions occurred. In fact, a California law was enacted in 1909, to protect the sea lion from extinction. Nevertheless, a slow and steady drain existed from numerous hunters illegally seeking trimmings (gall bladders, whiskers and genital organs) for trade with China. Steller bulls were killed in such large numbers, Bonnot (1930) writes, "it is surprising that there are any left to carry on the necessary breeding."

Collectors of sea lions for zoos and circuses also had an impact on sea lion populations. "The collectors...who take only California cows when possible, have harried the Californias on the Channel islands to such an extent that several of the larger rookeries have been materially reduced or abandoned" (Bonnot, 1930).

By 1938, California law gave complete protection to sea lions, and little evidence was seen of any systematic hunting at offshore rookeries where trimming hunters formerly worked (Bonnot, Clark, Hatton, 1938). From 1937 to about 1939, several commercial boats were harvesting sea lions for use in pet food (Abbott, 1939). The catch was primarily California sea lions in Mexican waters. This seems to be the last commercial effort toward the utilization of sea lions. Subsequently, sea lions were subject to shooting from fishing boats and continued capture for use in exhibitions.

NATURE AND EXTENT OF AVAILABLE DATA

Because the nature of sea lion exploitation is so diverse, no single set of data is likely to be, in itself, useful for the analysis of the pre-exploited population level. The trends in sea lion numbers could potentially be reconstructed with the compilation of many data sources. Thus far, reliable data representing any of the early forms of exploitation have not been discovered. The available limited data fall into two categories: official censuses and incidental records.

Before 1950, official sea lion censuses were conducted by the Department of Fish and Game in 1927, 1928, 1930, 1936, 1938, 1939, 1946 and 1947. Censuses taken after 1946 were made using an improved combination of observers and methods and must therefore be interpreted differently than earlier recordings (Bonnot, 1946). Early censuses were made by surveying the rookeries and hauling grounds from a boat. After 1946, both patrol personnel and marine biologists made direct observations and took photographs from boats, airplanes and blimps (Main, 1969). Thus, a mixture of surface tallies, which excluded pups, and aerial techniques, which sometimes did not, created an aggregate count not comparable with prior ones (Ripley, 1962). Table one summarizes the result of early censuses.

The nature of data relevant to historic sea lion exploitation levels, beyond official censuses, may be described as incidental and sporadic. Prior to censusing, comprehensive logs or organized data collections which could be used to establish historic population levels are not available. Instead, any useful information must be reconstructed from ships' logs, incidental qualified observations, newspaper articles, personal memos, memories of old fishermen, and testimonies at State hearings. The materials for any phase of Pacific maritime history are not only scattered but fragmentary (Ogden, 1941).

Perhaps Scammon's subjective observations of the late 1860's are the most valuable description of early sea lion exploitation. He states "a few years ago great numbers of sea lions were taken along the coast of upper and lower California, and thousands of barrels of oil were obtained. The number of seals slain exclusively for their oil would appear fabulous when we realize that it requires on average, throughout the season, the blubber of three or four sea lions to produce a barrel of oil" (Scammon, 1874). Although no specific numbers were given, it seems plausible that tens of thousands of sea lions were taken from what previously had been described as pristine population levels.

TABLE I
Number of Seal Lions Counted on Rookeries and Hauling Grounds in
Various Years

Locality	1927	1928	1930	1936	1938	1946
St. George Reef to Cape Mendocino.....	2,400	1,511	1,600	1,452	918	902
To Pt. Arena.....	300	208	300	142		148
To Pt. Reyes.....				54	6	111
To Pigeon Point.....	150	42		4	2	59
Farallon Islands.....	706	540	928	525	447	950
Pt. Ano Nuevo.....	1,500	1,500	2,500	1,200	2,000	1,900
To Pt. Lobos.....		270	209	338	191	402
To Pt. Conception.....	657	337	357	509	415	696
Northern California.....	5,013	4,400	6,894	4,224	3,979	5,168
To Pt. Loma (Mainland).....						36
San Miguel Island.....	744	1,021	825	1,879	2,706	2,819
Santa Rosa Island.....	49	38	12	52	20	
Santa Cruz Island.....	233	203	208	200	141	1,075
Anacapa Island.....	34	27	11	11	10	81
Santa Barbara Island.....	125	327	8	600	500	2,056
San Clemente Island.....	265	251	347	435	490	843
Santa Catalina Island.....					15	104
San Nicolas Island.....	Not visited	Not visited	Not visited	Not visited	Not visited	294
Southern California.....	1,450	1,867	1,411	3,177	3,892	7,338
All California.....	7,063	6,273	7,305	7,401	7,861	12,506

(From California Sea Lion Census for 1947)

In the 1902 report of the Commissioner, Merriam states, "It was the intent of the Commission to kill 10,000 of the presumed population of 30,000 sea lions along the California coast (those people who were more familiar with the sea lion rookeries said this was an over-estimation of the population size, which they believed to be less than 10,000)." Rutter (1902) reports "probably half the sea lions of California are found at the Farallon Islands and it seems doubtful whether the total number on the coast amounts to 5000." On April 27, 1899, permission was granted to the Fish and Game Commission to kill sea lions on federal lighthouse reservations. The next month, however, permission was revoked, but not before several thousand sea lions were killed at Ano Nuevo Island (Bonnot, 1928).

Paul Bonnot, whose official involvement in censusing stretches some 30 years, has observed and recorded information which indicates, in a general sense, the level of sea lion exploitation. He reports, "Captain Nidever of San Pedro has supplied me with the information that in 1907 and 1908 several men systematically hunted sea lion bulls at San Miguel Island and killed practically all bulls of breeding age" (Bonnot, 1928). During his censusing activities, Bonnot recorded incidental observations of the activities of trimming hunters: 62 sets of trimmings collected at Cape Mendocino Rookery in 1927; several men practically wiped out the Point Arena Rookery in 1920; the extermination of the Point Reyes Rookery; the reduction of the Farallon Islands, the largest rookery along the coast reduced to a few Steller bulls and six Californias; great many animals killed in May at Purissima hauling grounds; reports of a good many adult animals shot through the head and washing ashore at Pescadero; the death of nearly 400 adults and every pup on Flea Island (near San Miguel island); 149 Steller bulls and 4 Californias killed in 1930. By 1938, the trimming hunters had stopped killing the adult bulls but "a good many are still killed annually by sportsmen and fishermen" (Bonnot, Clark, Hatton, 1938). Fry (1939) reports many .22 cartridges found on Santa Barbara Island and a fisherman that boasted of a large raid.

During the late 1930's, sea lions were used in the production of dog and cat food. The majority of animals caught were believed to be in Mexican waters, but some hunting is known to have occurred off the California coast. Abbot states in a letter to the Department of Fish and Game in 1937 that an airplane passing over them counted a large number of seals on the decks of three boats. It appears that Dr. Ross Pet Food Company was operating two killer boats and one canning factory ship (in Cass, in press). After 1940, commercial exploitation had waned, but pressure on the populations continued.

In the Senate Commission Hearings of 1960, Harry Anderson states "during World War II, airplanes off Goleta, in Santa Barbara, dropped to shoot at sea lions and killed quite a few." He also states that sea lions taken for exhibition purposes are around one-hundred per year (Senate Fact Finding Committee, 1961). In a 1947 letter between California Department

of Fish and Game employees, Julie Phillips and Dick Croaker, a 20% mortality rate from disease was estimated (Hubbs Research Collection).

The State Fish and Game agency attempted another control program in 1945 but ceased the killing after two days of work by fifteen men, after the dispatch of 350 sea lion pups (Senate Committee, 1961). The types of exploitations that took place from the late 1930's have, for the most part, stopped. Under Section 4500 of the Fish and Game code, sea lions could still be shot from boats.

The nature of the data, as described above, is scant and only vaguely contributes to a quantitative understanding of sea lion exploitation and historic population levels.

RESULTS

The primary objective of this research was to establish whether any individuals or organizations had (or had knowledge of) any data which could be used to improve existing historic records. Thus, the project involved the locating and questioning of sources with past association with sea lion exploitation in California.

The following is a list of individuals and organizations contacted and asked: a) their knowledge of any quantitative data for any of the early forms of sea lion exploitation, b) specific knowledge of log books, newspaper articles, memos, export reports, or licensing records which could contribute to our quantitative understanding of historic sea lion populations, c) suggestions for further inquiry.

California Academy of Sciences - Robert Orr
 Cal. Dept. of Fish and Game -
 Richard Croaker - retired Fish and Game biologist
 Doyle Hanan
 John Scholl
 Eric Knaggs
 Russel Goodrich
 Daniel Miller - retired Fish and Game Biologist
 Julie Phillips - retired Fish and Game Biologist
 Sonny Castagnola - Santa Barbara fisherman
 Friends of the Sea Lion - William Ford
 Friends of the Sea Otter - Margaret Owings
 Ralph Felbric - Santa Barbara Botanical Garden
 Richard Headly - Collector for zoos and aquaria

Laura Hubbs
 Hubbs Research Archive
 Huntington Library Research Collection
 L.A. County Museum of Natural History
 L.A. Times Research Department
 Steven Leatherwood - Hubbs/Sea World Research Institute
 Marineland - William Walker
 Naval Ocean Systems Center - Sam Ridgeway
 National Marine Fisheries Service -
 Virginia Cass
 Douglas DeMaster
 Robert DeLong
 James Lecky
 San Diego Zoological Society - Marvin Jones
 Santa Barbara Museum of Natural History - Charles Woodhouse
 Sea Grant Marine Advisor - John Richards, Santa Barbara
 Univ. of Calif. Los Angeles - George Bartholomew
 Univ. of Calif. Santa Barbara - Larry Wilcox
 Univ. of Calif. Santa Cruz - Michael Bonnell
 U.S. Fish and Wildlife Service
 U.S. Coast Guard - Dept. of Records and Documentation

Of the preceding list, no individual or organization was able to significantly contribute to the existing historic records. Dr. Robert Orr reports that he attempted the same sort of inquiry in the late 1940's and found no concrete data. Dr. Charles Woodhouse states, "it would be very hard to find something definite since no records were kept back then." Indeed, nearly every individual contacted knew of no information beyond that stated in current literature.

The Carl Hubbs' Archive at the Scripps Institution of Oceanography has a collection of observations from the 1940's. A newspaper article in the collection reports that 3000 sea lions were caught for zoos and aquaria since 1902. Richard Headly, a long-time collector of sea lions, verified an early catch of 150-200 sea lions per year (personal communication).

Prior to the official censusing of 1927, the historic population record for sea lions on the California coast remains a weak collection of memos and personal observations. In the preface to Scammon's, "The Marine Mammals of the Northwest Coast of North America," Carl Hubbs summarizes the character of the earliest of data: "until a very few years ago the marine mammals of the Pacific Coast were among the least known of the larger animals of North America, and most of what little was known, and quoted, had been published in 1874 in this treatise" (Scammon, 1874).

Because of the diverse nature of sea lion exploitation, there will never be a comprehensive record of historic population levels. At best, we can continue to add clarity to our, less than sharp, picture. Research efforts could be shifted from published information specific to sea lions

to the latent information of newspaper articles and general historic profiles and documentation. Specifically, an approach similar to Ogden's (1941) reconstruction of the historic profile of sea otter exploitation would be helpful. He writes, "the Bancroft Library's rich treasury of manuscripts is a start, and other public repositories in the state offer additional help. But since actors on the sea stage usually represent private rather than public agencies, their documentary materials are not always found in centralized files. All along the coast, in homes both humble and luxurious, are housed rare and yellow documents precious for maritime study" (Ogden, 1941). Identification of vessels engaged in collection of sea lions could potentially be compiled with adequate archival research (see Ogden 1941 for a list of public, private and foreign archives useful in his research). A partial list includes:

- Archive General y Publico de Nacion, Mexico City
- Bancroft Library, Berkeley
- Biblioteca Nacional, Mexico City
- California Historical Society, San Francisco
- Huntington Library, San Marino
- Harvard University Library
- Library of Congress, Washington, D.C.
- Los Angeles Public Library
- Massachusetts Historical Society, Boston
- Museo Nacional, Mexico City
- Secretaria de Gobernacion, Mexico City
- University of California Library, Berkeley
- Widner Memorial Library, Harvard University.

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